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DISCUSSION

Dr Gustavo Oderich (*Rochester, Minn*). I would like to congratulate you on a very important paper. I think the topic is very pertinent now that we are exploring using lower-profile stents for infrarenal aneurysms. A little bit more about your methodology. Can you tell us whether you analyzed other thromboembolic events in addition to the classic end point of limb occlusion? It would be ideal for future comparisons with other devices to have more granularity on thrombus formation and changes in the ankle-brachial index. Also, have you evaluated changes such as nonocclusive thrombus formation in the limbs using repeated computed tomography (CT) scans?

Dr Laura van Zeggeren. Thank you. In this study, we focused on patients who had a symptomatic obstruction, defined as clinical symptoms of limb ischemia in combination with a complete occlusion of the endograft (body or a limb) or stenosis. In the majority of patients, we found a complete occlusion, but there were also patients who presented with claudication and who had a significant stenosis or thrombus of one of the graft limbs. Ankle-brachial index data were not available in this study. We did not analyze CT scans of asymptomatic patients for the presence of thrombus or stenosis in the current study.

Dr Ian Loftus (*London, UK*). Can you tell us any more about the native anatomy here as to whether these were predictable or not? These are very high limb occlusion rates. If you included the asymptomatic obstructions, this must be closer to 8%. So is this a problem with the device or is it because the low profile device is pushing the boundaries of what you can treat?

Dr van Zeggeren. This is a very interesting question. In the present study we only evaluated patients with a symptomatic obstruction so we cannot say anything about the asymptomatic obstruction rate. Now that we have found an endograft obstruction rate of 4.0%, it is indeed essential to further investigate whether there is a relationship between complex anatomy and graft obstruction and to identify other possible risk factors in order to get a better understanding of the pathophysiology of graft obstruction and answer your last question.

Dr John Ricotta (*Washington, DC*). Did the patients who obstructed have what looked like difficult anatomy when you looked at their preoperative CT scans?

Dr van Zeggeren: We did look at the preoperative scans and there certainly were patients with difficult anatomy, but in this stage of the study, we cannot statistically evaluate whether this is a risk factor for obstruction because we did not evaluate CT scans of patients without symptomatic obstructions. As mentioned earlier, it is worthwhile—and we are about—to further investigate this in order to extract predictive factors for obstruction and learn more about patients and endografts at risk.

Dr Jean-Paul de Vries (*Nieuwegein, The Netherlands*). I am the senior author of the manuscript. Approximately 30% of the patients were treated outside the instructions for use, and this was mainly because of the proximal infrarenal necks, with heavy angulation, large diameter, or short necks. Concerning the access arteries, perhaps a small percentage of the patients were outside the instructions for use.

Dr Gale Tang (*Seattle, Wash*). Speaking to that, did you look at how many of these devices were extended into the external iliac, or were these patients with very small external iliac diameters?

Dr van Zeggeren. That is a good question, especially because extension of the graft into the external iliac artery has been described as risk factor for graft obstruction in the literature. In a small percentage of patients in the obstruction group, there was extension of the graft into the iliac artery. We did not have data on the external iliac artery diameters of the whole population or whether they were deployed in the external iliac artery and, therefore, did not separately analyze this in the obstruction group. However, we will more closely look at the iliac anatomy of the patients in the obstruction group to get a better understanding of possible risk factors that can be evaluated in the future.

Dr Edward Woo (*Philadelphia, Pa*). One other question: You have a high majority of patients that you bailed out with surgical methods. Were all of these patients attempted percutaneously first; and if not, how come?

Dr van Zeggeren. Almost all of the patients who were treated surgically were directly treated surgically. Four patients had first an endovascular attempt to treat the graft occlusion, but these were not successful.

Dr Woo. Do you know why not?

Dr van Zeggeren. An attempt was made to start thrombolysis, but we could not pass the obstruction with guidewires.